AMENDMENTS TO THE CLAIMS:

This listing of claims will replace all prior versions, and listings, of claims in the application:

LISTING OF CLAIMS:

1. (Original) An *n*-type diamondoid material comprising an electron-donating heteroatom.

2. (Original) The *n*-type diamondoid material of claim 1, wherein the electron-donating heteroatom is a group V element.

3. (Original) The *n*-type diamondoid material of claim 1, wherein the electron-donating heteroatom is selected from the group consisting of nitrogen, phosphorus, and arsenic.

4. (Original) The *n*-type diamondoid material of claim 1, wherein the material comprises an aza-diamondoid.

5. (Original) The *n*-type diamondoid material of claim 1, wherein the electron-donating heteroatom occupies a substitutional site on the diamond lattice.

6. (Original) The *n*-type diamondoid material of claim 1, wherein the electron-donating heteroatom is sp^3-hybridized in the diamond lattice.

7. (Original) The *n*-type diamondoid material of claim 1, wherein the diamondoid is selected from the group consisting of adamantane, diamantane, and triamantane.

8. (Original) The *n*-type diamondoid material of claim 1, wherein the diamondoid is selected from the group consisting of tetramantane, pentamantane, hexamantane, heptamantane, octamantane, nonamantane, decamantane, and undecamantane.

9. (Original) The *n*-type diamondoid material of claim 1, wherein the material is a polymerized heterodiamondoid.

10. (Original) The polymerized heterodiamondoid material of claim 9, further including a metal atom to enhance electrical conductivity.

11. (Original) The polymerized heterodiamondoid material of claim 10, wherein the metal is gold.

12. (Original) A *p*-type diamondoid material comprising an electron-withdrawing heteroatom.

13. (Original) The *p*-type diamondoid material of claim 12, wherein the electron-withdrawing heteroatom is a group III element.

14. (Original) The *p*-type diamondoid material of claim 12, wherein the electron-withdrawing heteroatom is selected from the group consisting of boron and aluminum.

15. (Currently Amended) The *p*-type diamondoid material of claim 12, wherein the material comprises [[an]] a boro-diamondoid.

16. (Original) The *p*-type diamondoid material of claim 12, wherein the electron withdrawing heteroatom occupies a substitutional site on the diamond lattice.

17. (Original) The *p*-type diamondoid material of claim 12, wherein the electron withdrawing heteroatom is sp^3-hybridized in the diamond lattice.

18. (Original) The *p*-type diamondoid material of claim 12, wherein the diamondoid is selected from the group consisting of adamantane, diamantane, and triamantane.

19. (Original) The *p*-type diamondoid material of claim 12, wherein the diamondoid is selected from the group consisting of tetramantane, pentamantane, hexamantane, heptamantane, octamantane, nonamantane, decamantane, and undecamantane.

20. (Original) The *p*-type diamondoid material of claim 12, wherein the material is a polymerized heterodiamondoid.

21. (Original) The polymerized heterodiamondoid material of claim 20, further including a metal atom to enhance electrical conductivity.

22. (Original) The polymerized heterodiamondoid material of claim 21, wherein the metal is gold.

23. (Original) An electrical *p-n* junction comprising a *p*-type diamondoid material and an *n*-type diamondoid material.

24. (Original) The *p-n* junction of claim 23, wherein the *n*-type diamondoid material is aza-heterodiamondoid.

25. (Original) The *p-n* junction of claim 23, wherein the *n*-type diamondoid material is phospho-heterodiamondoid.

26. (Original) The *p-n* junction of claim 23, wherein the *p*-type diamondoid material is boro-heterodiamondoid.

27. (Original) A diamondoid transistor comprising an *n*-type heterodiamondoid material and a *p*-type diamondoid material.

28. (Original) The diamondoid transistor of claim 27, wherein the transistor comprises an *n*-*p*-*n* field effect transistor.

29. (Currently Amended) The diamondoid transistor of claim 27, wherein the transistor comprises [[an]] a *p*-*n*-*p* field effect transistor.

30. (Original) The diamondoid transistor of claim 27, wherein the *n*-type diamondoid material is aza-heterodiamondoid.

31. (Original) The diamondoid transistor of claim 27, wherein the *n*-type diamondoid material is phospho-heterodiamondoid.

32. (Original) The diamondoid transistor of claim 27, wherein the *p*-type diamondoid material is boro-heterodiamondoid.

33. (Currently Amended) The diamondoid transistor of claim 27 further comprising a source, gate, and drain, wherein the source and drain are fabricated ~~frabricated~~ from the *n*-type heterodiamondoid material, and the gate is fabricated from the *p*-type diamondoid material.

34. (Currently Amended) The diamondoid transistor of claim 27 further comprising a source, gate, and drain, wherein the source and drain are fabricated ~~frabricated~~ from the *p*-type heterodiamondoid material, and the gate is fabricated from the *n*-type diamondoid material.

35. – 38. (Canceled)

39. (Currently Amended) A diamondoid transistor comprising ~~a substantially single material, the transistor comprising~~ electrically conducting regions and electrically insulating regions, wherein:

the electrically conducting regions of the transistor comprise *n* and *p*-type heterodiamondoid materials; and

the electrically insulating regions of the transistor comprise undoped diamondoid materials.

40. (Original) The transistor of claim 39, wherein the *n*-type diamondoid material comprises aza-heterodiamondoid.

41. (Original) The transistor of claim 39, wherein the *n*-type diamondoid material comprises phospho-heterodiamondoid.

42. (Original) The transistor of claim 39, wherein the *p*-type diamondoid material comprises boro-heterodiamondoid.